

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A fluidic device comprising:

at least one microchannel, and

at least one capacitive micromachined ultrasonic transducer [micromachined into] formed in one wall of said microchannel.

Claim 2 (original): A fluidic device as in claim 1 in which the microchannel has dimensions in the range 1 μm to 500 μm or more.

Claim 3 (currently amended): A fluidic device comprising:

a base of semiconductor material,

at least one capacitive micromachined ultrasonic transducer [micromachined] formed in said base of semiconductor material, and

a top having a microgroove sealed to said base with the microgroove over the ultrasonic transducer whereby to form a microchannel with an ultrasonic transducer in one wall of said channel.

Claim 4 (original): A fluidic device as in claim 3 in which the microchannel has dimensions in the range of 1-500 μm .

Claim 5 (canceled): A fluidic device as in claim 3 or 4 in which the ultrasonic transducer is a capacitive micromachined ultrasonic transducer.

Claim 6 (previously amended): A fluidic device as in claim 4 including at least two longitudinally spaced transducers and said top has its microgroove oriented over both of said transducers.

Claim 7 (canceled): A fluidic device as in claim 4 in which the base is semiconductor material and the ultrasonic transducer is micromachined in said material.

Claim 8 (original): A fluidic device as in claim 4 in which said microgroove includes a compliant membrane which is disposed opposite said ultrasonic transducer.

Claim 9 (withdrawn): A fluidic device as in claim 4 including a processor for operating said ultrasonic transducer to emit pulses which echo off the opposite wall and process the pulse and echo signals to provide a measure of the acoustic impedance of the fluid in said microchannel.

Claim 10 (withdrawn): A fluidic device as in claim 6 including a process for operating said ultrasonic transducers to measure the time-of-flight of ultrasound in the direction and the opposite direction of fluid flow and provide a measure of fluid velocity.

Claim 11 (withdrawn): A fluidic device as in claim 6 including a processor for driving said ultrasonic transducers to generate Stoneley waves for pumping fluid in said channels.

Claim 12 (withdrawn): A fluidic device as in claim 8 in which a processor operates said transducer to generate ultrasonic pulses which are reflected by said membrane and processes the pulse and echo signal to measure the pressure of the fluid in said microchannel.

Claim 13 (withdrawn): A fluidic device as in claim 12 including a plurality of ultrasonic transducers and membranes spaced along the channel to thereby measure the pressure drop along the channel.

Claim 14 (withdrawn): A fluidic device as in claim 4 including a processor for operating said ultrasonic transducer to emit pulses and set ultrasonic resonance whereby to measure fluid properties or for counting particles in said fluid.

Claim 15 (original): A fluidic device as in claim 4 in which the base is silicon or a dielectric material.

Claim 16 (previously amended): A fluidic device comprising:

at least one microchannel having opposed walls,

at least one capacitive micromachined ultrasonic transducer micromachined into one wall, and

a flexible membrane on the opposite wall opposite the ultrasonic transducer whereby ultrasonic waves from the ultrasonic transducer are reflected back to the transducer by the flexible membrane.

Claim 17 (withdrawn): A flexible device as in claim 9 including a processor configured to process signals to and from said ultrasonic transducer and providing an output indicative of pressure.

Claim 18 (currently amended): A fluidic device comprising:

a silicon base,
one or more capacitive micromachined ultrasonic transducers [micromachined] formed into said base, and
a top having a microgroove sealed to said base with the microgroove over said capacitive micromachined ultrasonic transducers.

Claim 19 (original): A fluidic device as in claim 18 including at least two capacitive micromachined transducers spaced along said channel.

Claim 20 (currently amended): A fluidic device as in claim [19] 18 including a processor for operating said transducers in a pulse echo mode.

Claim 21 (original): A fluidic device as in claim 19 including a processor for operating said transducers to receive ultrasonic pulses from one another.

Claim 22 (currently amended): A fluidic device as in claim [18] 20 in which said microgroove includes a compliant membrane opposite said ultrasonic transducer.

Claim 23 (original): A fluidic device as in claim [18] 19, including a processor for operating [in which] the micromachined ultrasonic transducer [is operated] to mix fluids in the channel.

Claim 24 (withdrawn): A fluidic device as in claim 18 in which the ultrasonic transducer is operated to pump fluids in said channel.

Claim 25 (withdrawn): A fluidic device as in claim 18 in which said ultrasonic transducer is operated to measure fluid characteristics.

Claim 26 (previously added): A fluidic device as in claim 5 in which the micromachined ultrasonic transducer is operated to mix fluids in the channel.